

REMARKS

Status of the Claims

- Claims 1-17 are pending in the Application after entry of this amendment.
- Claims 1-17 are rejected by the Examiner.

Specification Amendment

Applicant amends paragraphs 0022 and 0023 of the specification to correct typographic errors. Applicant submits that no new matter is added as a result of this specification amendment.

Claim Rejections Pursuant to 35 U.S.C. §103 (a)

Claims 1-17 stand rejected pursuant to 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,185,663 to Burke in view of U.S. Patent No. 6,119,128 to Courter. The Applicants respectfully traverse the rejection.

Burke discloses a shared persistent memory file system that provides persistent memory block allocation with multiple redo logging of memory blocks. The file system employs a three part block state indicator (V,A,U). V is a volume indication. A is an allocation sequence indication. U is an update sequence number indication. The file system (a) generates indication of the allocation sequence in the allocation map in a manner free of initially reading the block from storage memory, (b) records the indication of volume, allocation sequence and update sequence in an entry of the transaction log of the requesting computer node, and (c) sets indications of volume, allocation sequence and update sequence on the subject block in storage memory. The file system includes redo recovery means for updating blocks in the storage memory upon a failure in the computer system. For each block being updated, the recovery means utilizes one transaction log and the block state indicators recorded therein corresponding to indications of volume and update sequence in the block in storage memory. (Abstract)

Applicant notes that the Office Action dated 5/31/06, page 2 states that Burke teaches “linking the primary catalog to the secondary catalogs (see figure 1)” . Yet, the Office Action states on the top of page 3 states:

“Burke does not teach creating a primary catalog comprising metadata of logical elements creating a primary catalog comprising metadata of logical elements of the units, the primary catalog referencing the units;

creating two secondary catalogs, each secondary catalog corresponding to a respective unit and comprising metadata of physical elements for the respective unit; and

maintaining the secondary catalogs such that the first unit is recoverable independently from the second unit.”

Applicant agrees with the above statement from page three, but does not agree that Burke teaches “linking the primary catalog to the secondary catalogs”. Since Burke fails to teach creating a primary and two secondary catalogs as defined in Claim 1, then Burke cannot logically teach linking the primary catalog to the secondary catalogs because the primary and secondary catalogs as defined in Claim 1 do not exist in Burke.

Applicant respectfully submits that Burke cannot, and does not, teach linking catalogs which it does not have. Applicant thus respectfully submits that not all elements of Claim 1 are found in the combination of Burke and Courter. For this reason alone, a prima facie case of obviousness has not been established according to 35 U.S.C §103(a) and MPEP 2143.03 because all elements of the claims are not found in the cited references. But there are yet more differences between the present claims and the cited references.

Courter teaches:

A method, apparatus, and article of manufacture for a computer implemented recovery system for restoring a database in a computer. The database contains objects and is stored on a primary data storage device connected to the computer. Objects of different types in the database are copied from the primary data storage device to a secondary data storage device. Modifications to the objects are logged in a log file. A recovery indicator is received that indicates that recovery of the objects in the database is required. The objects are copied from the secondary data storage device to the database on the primary data storage device. Modifications in the log file are applied to the copied objects during one pass through the log file. (Abstract)

The prior art discussion in Courter in column 2 lines 5-13 indicate that normally, indexes are rebuilt in a recovery scenario as a separate step after the log file is applied to a partition copies back from a secondary storage device to a primary storage device. Courter teaches:

In either case, for recovery, the partitions are typically copied from the secondary data storage device to the primary data storage device. Next, using the log file, the copied data is modified based on the operations in the log file. Then, the indexes are rebuilt. In particular, to rebuild the indexes, keys are copied from each row of each partition, sorted, and then used to create a partitioning index. Additionally, the table index is rebuilt via the same technique. (col. 2 lines 5-13).

Courter addresses this time consuming task of rebuilding indexes by performing the rebuild of indexes simultaneously with the recovery of partitions. As stated in col. 2 lines 42-49:

An object of the invention is to provide an improved recovery system for a database. Another object of the invention is to provide recovery for partitions, partitioning indexes, and table indexes simultaneously. Yet another object of the invention is to provide a recovery system for a database that requires only one pass of a log file to apply modifications to the database. (col 2, lines 42-49).

The simultaneous recovery of data ns indexes results in a significant reduction in recovery time since the simultaneous recovery and index rebuild is performed in a single pass of the log file. As stated in col. 4, lines 57-60:

The recovery system 122 allows for independent recovery of the data and indexes, and a significant decrease in elapsed time since the log file updates are done for all objects in the database with one pass through the log file. (col. 4 lines 57-60).

Col. 6 lines 51-59 summarizes the benefit of the Courter invention:

In summary, the present invention discloses a method, apparatus, and article of manufacture for a computer-implemented recovery system. The present invention provides an improved recovery system for a database. Additionally, the present invention provides recovery for partitions and partitioning indexes simultaneously. Moreover, the present invention provides a recovery system for a database that requires only one pass of a log file to apply modifications to the database. (col. 6, lines 51-59).

Applicant submits that copying a partition from a primary storage device to a secondary storage device, then coping from the secondary storage device back to the primary storage device, then applying the log file to the partition in the primary storage device only once is the major operational aspect of Courter. Applicant also submits that Courter does not disclose creating a primary catalog at all. Courter does disclose a primary and secondary data storage devices, such as magnetic tape, but does not disclose a primary catalog comprising

metadata of logical elements of the units, the primary catalog referencing the units and two secondary catalogs, each secondary catalog corresponding to a respective unit and comprising metadata of physical elements for the respective unit as recited in Claim 1.

Specifically, Courter discloses at col. 4 lines 35-44:

The present invention provides a recovery system 122 for recovering different types of objects using only one pass through a log file. In particular, table partitions of a database, along with indexes (e.g., partitioning indexes and table indexes), are copied to one or more data storage devices, such as magnetic tape. The database may be stored on a primary data storage device, while the copies of the database partitions and indexes are stored on a secondary data storage device. The primary and secondary data storage devices could be the same or different devices. (col. 4 lines 35-44).

Thus, Courter teaches that a primary storage device, such as a magnetic tape, can have stored on it, table partitions of a database along with indexes. Applicant submits that such a primary storage device, made of magnetic tape, having table partitions of a database is not the same as a primary catalog comprising metadata of logical elements of a recovery unit or a secondary catalog having metadata of physical elements as recited in Claim 1 because, in the first instance, a catalog is not a magnetic tape device.

Applicant also notes that Courter does not teach any use of metadata. The subject of metadata is absent from the specification of Courter. Thus, Courter cannot be used as a reference that specifically teaches creating a primary catalog comprising metadata of logical elements of the units as in Claim 1 because Courter fails to teach primary catalogs and fails to teach metadata. Likewise, Applicant notes that Courter also fails to teach two secondary catalogs where each secondary catalog corresponds to a respective recovery unit, where each secondary catalog comprises metadata of physical elements for the respective recovery unit as in Claim 1.

Also, as is the case in Burke, since a primary and two secondary catalogs are not taught or suggested in Courter, then a linking of the primary catalog to the secondary catalogs cannot logically be found in the teachings of Courter. As an additional consequence of Burke and Courter failing to teach a primary and a secondary catalog, with all of the limitations recited in Claim 1, then neither Burke nor Courter, considered either alone or combined, can teach or suggest maintaining the secondary catalogs such that the first unit is recoverable independently from the second unit as recited in Claim 1.

The teachings of Burke and Courter, considered separately or combined, fail to meaningfully teach the following elements of Claim 1:

- creating a primary catalog comprising metadata of logical elements of the units, the primary catalog referencing the units;

- creating two secondary catalogs, each secondary catalog corresponding to a respective unit and comprising metadata of physical elements for the respective unit;

- linking the primary catalog to the secondary catalogs; and

- maintaining the secondary catalogs such that the first unit is recoverable independently from the second unit.

Wherein Claim 1 recites primary and secondary catalogs, Burke is completely without such catalogs (see Office Action dated 5/31/06, page 3). Wherein Claim 1 recites primary and secondary catalogs, Courter teaches primary and secondary storage devices, such as magnetic tape. Whereas Claim 1 recites the primary and secondary catalogs containing specific metadata, Courter fails to teach any form of metadata. Wherein Claim 1 recites linking the primary catalog to the secondary catalogs, neither Burke nor Courter can possibly teach a linking of an element that neither teaches. Wherein Claim 1 recites maintaining the secondary catalogs such that the first unit is recoverable independently from the second unit, neither Burke nor Courter can possibly teach maintaining an element that neither teach.

Since the combination of Burke and Courter fail to teach all of the elements of independent Claim 1, then Applicant respectfully submits that a prima facie case of obviousness has not been established according to 35 U.S.C. §103(a) and MPEP 2143.03 which requires that all claim elements be taught or suggested by the cited references. Also, as indicated in MPEP 2143.03, the dependent Claims 2-6, which depend from independent Claim 1 are likewise rendered non-obvious.

Since independent Claims 7 and 12 have similar elements not found in either Burke or Courter, these claims, and their respective dependent claims are also rendered non-obvious. Applicant thus respectfully requests withdrawal of the 35 U.S.C. §102(a) rejection of Claims 1-17 as these claims patentably define over the cited art because all elements are not found in the cited art.

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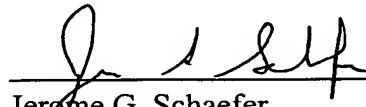
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Conclusion

Applicants respectfully submit that the pending claims patentably define over the cited art. Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. §103(a) rejection. A Notice of Allowance for all pending claims is earnestly requested.

Respectfully Submitted,

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